

**CLAIMS:**

What is claimed is:

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- 1 1. A data management appliance, comprising:  
2 a random-access storage unit; and  
3 control circuitry adapted to receive commands from a  
4 host computer system,  
5 wherein in response to the control circuitry  
6 receiving a write command from the computer system, the  
7 control circuitry updates the random-access storage unit  
8 to include information associated with the write command  
9 and  
10 in response to a read command including a logical  
11 address and a time value, the control circuitry  
12 retrieves, from the random-access storage unit, data  
13 representing contents of the logical address at a time  
14 represented by time value.
- 1 2. The data management appliance of claim 1, wherein  
2 the write commands are replicated from write commands  
3 issued to a primary storage device.
- 1 3. The data management appliance of claim 1, wherein  
2 the write commands are received from the computer system  
3 through a replicating controller.
- 1 4. The data management appliance of claim 1, wherein  
2 the write commands are replicated by the computer system.

1 5. The data management appliance of claim 1, wherein  
2 the random-access storage unit stores a forward journal.

1 6. The data management appliance of claim 1, wherein  
2 the random-access storage unit stores a mirror-in-the-  
3 middle (MIM) containing a copy of contents of a primary  
4 storage device at a fixed point in time.

1 7. The data management appliance of claim 6, wherein  
2 the random-access storage unit stores at least one  
3 snapshot containing changes, that when made to contents  
4 of the mirror-in-the-middle (MIM), would result in a  
5 previous version of the contents of the primary storage  
6 device.

1 8. The data management appliance of claim 7, wherein  
2 the control circuitry stores a mapping object, wherein  
3 the mapping object maps logical addresses into physical  
4 addresses on the mirror-in-the-middle (MIM) and contained  
5 in the at least one snapshot.

1 9. The data management appliance of claim 1, wherein  
2 the control circuitry receives commands from the computer  
3 system through a storage network.

1 10. The data management appliance of claim 1, wherein  
2 the random-access storage unit includes memory.

1 11. The data management appliance of claim 1, wherein  
2 the random-access storage unit includes a disk.

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1 12. A data management appliance, comprising:  
2 a random-access storage unit; and  
3 control circuitry adapted to receive commands from a  
4 computer system,  
5 wherein in response to the control circuitry  
6 receiving a write command from the computer system, the  
7 control circuitry updates the random-access storage unit  
8 to include information associated with the write command;  
9 in response to a mount command including a time  
10 value, the control circuitry configures itself to perform  
11 future read operations with respect to a fixed time  
12 represented by the time value; and  
13 in response to a read command including a logical  
14 address, the control circuitry retrieves, from the  
15 random-access storage unit, data representing contents of  
16 the logical address at the fixed time.

1 13. The data management appliance of claim 12, wherein  
2 the write commands are replicated from write commands  
3 issued to a primary storage device.

1 14. The data management appliance of claim 12, wherein  
2 the write commands are received from the computer system  
3 through a replicating controller.

1 15. The data management appliance of claim 12, wherein  
2 the write commands are replicated by the computer  
3 system.

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1 16. The data management appliance of claim 12, wherein  
2 the random-access storage unit stores a forward journal.

1 17. The data management appliance of claim 12, wherein  
2 the random-access storage unit stores a mirror-in-the-  
3 middle (MIM) containing a copy of contents of a primary  
4 storage device at a fixed point in time.

1 18. The data management appliance of claim 17, wherein  
2 the random-access storage unit stores at least one  
3 snapshot containing changes, that when made to contents  
4 of the mirror-in-the-middle (MIM), would result in a  
5 previous version of the contents of the primary storage  
6 device.

1 19. The data management appliance of claim 18, wherein  
2 the control circuitry stores a mapping object, wherein  
3 the mapping object maps logical addresses into physical  
4 addresses on the mirror-in-the-middle (MIM) and  
5 contained in the at least one snapshot.

1 20. The data management appliance of claim 12, wherein  
2 the control circuitry receives commands from the  
3 computer system through a storage network.

1 21. The data management appliance of claim 12, wherein  
2 the random-access storage unit includes memory.

1 22. The data management appliance of claim 12, wherein  
2 the random-access storage unit includes a disk.

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